ITC-801
COMPILER DESIGN

UNIT-I
Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer.

UNIT-II
The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT-III
Bottom–Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

UNIT-IV
Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

UNIT-V
Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

REFERENCE BOOKS:
1.Principles of compiler design -A.V. Aho . J.D.Ullman; Pearson Education.
2.Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
3.A. C. Holub. Compiler Design in C , Prentice-Hall Inc., 1993.
4.Raghavan, Compiler Design, TMH Pub.

LIST OF EXPERIMENTS:

1. Develop a lexical analyzer to recognize a few patterns.
2. 2.Write a programme to parse using Brute force technique of Topdown parsing.
3. Develop LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser
6. Write a program for generating for various intermediate code forms i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. 9 Generate YACC specifications for a few syntactic categories.
10. 10 Given any intermediate code form implement code optimization techniques

ITC-802
WEB TECHNOLOGY

UNIT-I
History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction to World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

UNIT-II
Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations, DTD files and basics of Cascading Style Sheet (CSS).Document object Model (DOM) history and levels, Document tree, DOM event handling.

UNIT-III
Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java.

UNIT-IV
Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server, Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI), Message Oriented Middleware (MOM), EJB, Microsoft's Distributed Component Object Model(DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

UNIT-V
Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications, Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

References:-.
1. J. C. Jackson, Web Technologies: A computer science perspective, Pearson Education.
2. A. S. Godbole & A. Kahate, Web Technologies: TCP/IP Architecture, and Java Programming, TMH.
3. Paul S. Wang Sanda, S Katila, An Introduction to Web Design, Programming, CENGAGE Learning.
4. N.P.Gopalan, J.Akilandeswari, Web Technology: A developer's Perspective, PHI Learning.

LIST OF EXPERIMENTS:

1. Adapt HTML and CSS syntax and semantics to build web pages.
2. Construct and visually format tables and forms using HTML and CSS
3. Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
4. Appraise the principles of object oriented development using PHP
5. Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

Department Elective VII
IT-803(A)
NETWORK MANAGEMENT

UNIT-I

Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration, Selected Management Strategy.

UNIT –II

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View, Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents, Setting up LAN Access, SNMP Configuration.

UNIT-III

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

UNIT-IV

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing UNIT, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

UNIT –V

Internet Control Message Protocols (ICMP):-Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package, Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

REFERENCES:
1.Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2.Stevens, TCP/IP Illustrated Volume-I, Pearson
3.J.Richard Burkey, Network Management Concept and Practice, PHI

Department Elective VII
ITC-803 (B)
Embedded Computer Systems

UNIT – I

Introduction to Embedded systems
Embedded Systems Vs General Computing Systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Purpose of Embedded systems ,Core of the Embedded system, Memory, Sensors and Actuators, Communication Interface, Embedded firmware, PCB and Passive Components, Characteristics and Quality attributes of a Embedded System .

UNIT – II

Design of Embedded Systems with 8bit Microcontrollers-8051
Factors for considering in selecting a Controller ,Designing with 8051 microcontroller Different addressing modes supported by 8051 , Instruction set for 8051 microcontroller. Fundamental issues in Hardware Software Co-Design , Computational models in Embedded Design .

UNIT – III

Embedded Hardware & Firmware Design and Development
Analog &Digital Electronic components, VLSI & Integrated circuit design, Electronic Design Automation tools , PCB layout Design and its fabrication .Embedded firmware design approaches , Embedded firmware Development Languages ,Programming in Embedded C . Integration and testing of Embedded Hardware and Firmware , Safe & robust Design, Reliability, Faults, errors & Failure, Functional Design, Architecture Design, Prototyping.

UNIT –IV

Embedded System Development Environment
Integrated Development Environment (IDE) , Types of files Generated on CrossCompilation , Disassembler / Decompiler, Simulators, Emulators and Debugging, Boundary Scan.

UNIT – V

Embedded Product Development Lifecycle(EDLC) and Trends in Embedded Industry
What is EDLC ,Objectives of EDLC , Different phases of EDLC , EDLC Approaches-Linear or waterfall model , Iterative Model , Prototyping/Evolutionary Model, Spiral Model . Processor trends in Industry , Embedded OS Trends , Development Language trends Open Standards, Frameworks and Alliances , Bottlenecks.

References:
1. Shibu, Introduction to Embedded System:, TMH
2. Barrett ,Embedded Systems :Design and Applications ,Pearson Education
3. Rajkamal, Embeded System, TMH
4. Vahid ,Givargis ,Embedded System Design ,Wiley
5. Balbno, Embedded Micro Computer System Cengage Learning
6. Siewert, Real Time Embeded System & Components, Cengage Learning
7. Peckol, Embeded System, Willey Indi

Department Elective VII
ITC-803(C)
ADVANCED CONCEPTS IN DATABASE SYSTEM

UNIT I

An overview of database, The Extended Entity Relationship Model and Object Model: The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

UNIT II

Query Processing, Optimization & Database Tuning: Algorithms For Executing Query Operations. Heuristics For Query Optimizations, Estimations of Query Processing Cost, Join Strategies for Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering & Indexing, Multiple Attribute Search Keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue in RDBMS.

UNIT III

Distributed Database System: Structure of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel & Pipeline Join, Distributed Query Processing In R * System, Concurrency Control In Distributed Database System, Recovery In Distributed Database System, Distributed Deadlock Detection and Resolution, Commit Protocols.

UNIT IV

Enhanced Data Model For Advanced Applications: Database Operating System, Introduction to Temporal Database Concepts, Spatial And Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues in Real Time Database Design.

UNIT V

Accessing databases from Web, JavaScript, JDBC, Java Servlets , database technology to Web related areas such as semi-structured databases and data integration, XML, XQuery, XPath, XML Schemas, distributed database design, distributed database transactions, and distributed query processing

REFERENCES:-
1. Majumdar & Bhattacharya, "Database Management System", TMH.
2. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley.
3. Korth, Silbertz, Sudarshan, " Database Concepts", McGraw Hill.
4. David M. Croenke and David J. Auer "Database Processing" Eleventh Edition, PHI
5. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill.
6. Peter Rob and Coronel, "Database Systems, Design, Implementation and Management", Cengage Learning
7. Data C J," An Introduction To Database System", Addison Wesley.
8. Bernstein, Hadzilacous, Goodman, "Concurrency Control & Recovery", Addison Wesley.

Department Elective VIII
ITC-804(A)
INFORMATION STORAGE & MANAGEMENT

UNIT-I

Introduction: - Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Data creation and The value of data to a business, Information Lifecycle Management, Challenges in data storage and data management, Solutions available for data storage, Core elements of a Data Center infrastructure, Data categorization.

UNIT-II

Storage Systems Architecture:- Intelligent disk subsystems overview, Contrast of integrated vs modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

UNIT-III

Introduction To Networked Storage: - Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, IP-SAN, Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN. Introduction to Information Availability: - Business Continuity and Disaster Recovery Basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles & techniques.

UNIT-IV

Managing & Monitoring: - Management philosophies (holistic vs. system & component), Industry management standards (SNMP, SMI-S, CIM), Standard framework applications, Key management, Metric analysis methodologies & trend analysis, Reactive and pro-active management best practices, Provisioning & configuration change planning, Problem reporting, prioritization, and handling techniques, Management tools overview.

UNIT-V

Securing Storage and Storage Virtualization: - Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

REFERENCE BOOKS:
1. EMC Corporation, Information Storage and Management, Wiley, India.
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill , Osborne, 2003.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill ,Osborne, 2001.
4. Additional resource material on www.emc.com/resource-library/resource-library.esp

Department Elective VIII
ITC-804 (B)
PHP TECHNOLOGY

UNIT-I

Introduction to PHP:-Evaluation of Php, Basic Syntax, Defining variable and constant, Php

Data type, Operator and Expression.

Handling HTML Form With PHP:- Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form , Redirecting a form after submission.

UNIT-II

Decisions and loop:- Making Decisions, Doing Repetitive task with looping , Mixing Decisions and looping with Html.

Function:- What is a function, Define a function, Call by value and Call by reference, Recursive function.

UNIT-III

String:- Creating and accessing String, Searching & Replacing String, Formatting String, String

Related Library function.

Array:- Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function.

UNIT-IV

Working with file and Directories:-Understanding file& directory ,Opening and closing a file, Coping ,renaming and deleting a file , Working with directories, Building a text editor , File Uploading & Downloading.

State management:-Using query string(URL rewriting), Using Hidden field ,Using cookies, Using session .

UNIT-V

String matching with regular expression:-What is regular expression, Pattern matching in

Php , Replacing text ,Splitting a string with a Regular Expression.

Generating Images with PHP:- Basics of computer Graphics, Creating Image , Manipulating

Image, Using text in Image

References:

(i.)   Learning PHP, MySQL, books by „ 0‟ riley Press

(ii.)   PHP & MySQL: Novice to Ninja by Kevin Yank

(iii.)   PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman

List of Experiments:-

1. Write a program to print Factorial of any number.

2. Write a program in PHP to print Fibonacci series.

3. Write a program to find whether a number is Armstrong or not.

4. Write a program to print Reverse of any number.

5. Write a program to print Reverse of any number.

6. Write a program to check whether a number is Prime or not.

7. Program to find whether a year is LEAP year or not.

8. Write a Program for finding the biggest number in an array without using any array functions.

9. Write a Program to swap two numbers in PHP.

10. Write a Program for finding the smallest number in an array

Department Elective VIII
ITC 804 (C)
HIGH PERFORMANCE COMPUTING

UNIT I

Introduction: Computational Science and Engineering: Computational Science and Engineering Applications; characteristics and requirements, Review of Computational Complexity, Performance: metrics and measurements, Granularity and Partitioning, Locality: temporal/spatial/stream/kernel, Basic methods for parallel programming, Real-world case studies (drawn from multi- scale, multi-discipline applications)

UNIT II

High-End Computer Systems : Memory Hierarchies, Multi-core Processors: Homogeneous and Heterogeneous, Shared-memory Symmetric Multiprocessors, Vector Computers, Distributed Memory Computers, Supercomputers and Petascale Systems, Application Accelerators / Reconfigurable Computing, Novel computers: Stream, multithreaded, and purpose-built

UNIT III

Parallel Algorithms: Parallel models: ideal and real frameworks, Basic Techniques: Balanced Trees, Pointer Jumping, Divide and Conquer, Partitioning, Regular Algorithms: Matrix operations and Linear Algebra, Irregular Algorithms: Lists, Trees, Graphs, Randomization: Parallel Pseudo-Random Number Generators, Sorting, Monte Carlo techniques

UNIT IV

Parallel Programming: Revealing concurrency in applications, Task and Functional Parallelism, Task Scheduling, Synchronization Methods, Parallel Primitives (collective operations), SPMD Programming (threads, OpenMP, MPI), I/O and File Systems, Parallel Matlabs (Parallel Matlab, Star-P, Matlab MPI), Partitioning Global Address Space (PGAS) languages (UPC, Titanium, Global Arrays)

UNIT V

Achieving Performance: Measuring performance, Identifying performance bottlenecks, Restructuring applications for deep memory hierarchies, Partitioning applications for heterogeneous resources, using existing libraries, tools, and frameworks

Text Books:
1. **Introduction to Parallel Computing,** AnanthGrama, Anshul Gupta, George Karypis and Vipin Kumar, 2nd edition, Addison-Welsey, 2003.
2. **Petascale Computing**: Algorithms and Applications, David A. Bader (Ed.), Chapman & Hall/CRC Computational Science Series, 2007

Reference Books:
1. An Introduction to Parallel Computing, Design and Analysis of Algorithms: Grama, A Gupta, G. Karypis, V. Kumar, 2/e, Addison-Wesley, 2003.
2. G.E. Karniadakis, R.M. Kirby II, Parallel Scientific Computing in C++ and MPI: A Seamless Approach to Parallel Algorithms and their Implementation, Cambridge University Press,2003.
3. Wilkinson and M. Allen, Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers, 2/E, Prentice Hall, 2005.
4. Parallel Programming in C with MPI and OpenMP, McGraw-Hill, 2004. G.S. Almasi and A. Gottlieb, Highly Parallel Computing, 2/E, Addison-Wesley, 1994.
5. Kai Hwang, "Scalable Parallel Computing", McGraw Hill 1998.

ITC-805 (A)
ARTIFICIAL INTELLIGENCE

UNIT I

Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A* algorithm, AO* algorithms etc, and various types of control strategies.

UNIT II

Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and nonmonotonic reasoning.

UNIT III

Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

UNIT IV

Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

UNIT V

Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

REFERENCES:-
1 Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
2 Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin.

ITC 805 (B)
ANDROID TECHNOLOGY

UNIT I
Introduction: What is Android, Android versions and its feature set The various Android devices on the market , The Android Market application store ,Android Development Environment - System Requirements, Android SDK, Installing Java, and ADT bundle - Eclipse Integrated Development Environment (IDE), Creating Android Virtual Devices (AVDs)

UNIT II
Android Architecture Overview and Creating an Example Android Application: The Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime – Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files,

UNIT III
 Android Software Development Platform
Understanding Java SE and the Dalvik Virtual Machine , The Directory Structure of an Android Project , Common Default Resources Folders , The Values Folder , Leveraging Android XML, Screen Sizes , Launching Your Application: The AndroidManifest.xml File ,
Creating Your First Android Application

UNIT IV
Android Framework Overview
Android Application Components, Android Activities: Defining the UI, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications Content Providers: Data Management, Android Intent Objects: Messaging for Components
Android Manifest XML: Declaring Your Components

UNIT V
Understanding Android Views, View Groups and Layouts
Designing for Different Android Devices, Views and View Groups, Android Layout Managers, The View Hierarchy, Designing an Android User Interface using the Graphical Layout Tool.

 Reference Books:
1. **Android** App Development for Dummies.
2. Head First **Android** Development.
3. Hello, **Android**: Introducing Google's Mobile Development Platform.
4. Professional **Android** 4th edition.

ITC 805 (C)
BIG DATA ANALYTICS

UNIT – 1

Hadoop Distributed File System Basics, Running Example Programs and Benchmarks, Hadoop MapReduce Framework, MapReduce Programming

UNIT – 2

Essential Hadoop Tools, Hadoop YARN Applications, Managing Hadoop with Apache Ambari, Basic Hadoop Administration Procedures

UNIT – 3

Business Intelligence Concepts and Application, Data Warehousing, Data Mining, Data Visualization

UNIT – 4

Decision Trees, Regression, Artificial Neural Networks, Cluster Analysis, Association Rule Mining

UNIT – 5

Text Mining, Naïve-Bayes Analysis, Support Vector Machines, Web Mining, Social Network Analysis

TEXT BOOKS:

1. Douglas Eadline,**"Hadoop 2 Quick-Start Guide: Learn the Essentials of Big Data Computing in the Apache Hadoop 2 Ecosystem",** 1stEdition, Pearson Education, 2016. ISBN-13: 978-9332570351

2. Anil Maheshwari, **"Data Analytics",** 1st Edition, McGraw Hill Education, 2017. ISBN-13: 978-9352604180

REFERENCE BOOKS:

3. Tom White, **"Hadoop: The Definitive Guide",** 4th Edition, O'Reilly Media,

4. Boris Lublinsky, Kevin T.Smith, Alexey Yakubovich,**"Professional HadoopSolutions",**

5. Eric Sammer,**"Hadoop Operations: A Guide for Developers and Administrators"**

ITC – 806 INDUSTRIAL TRAINING PROJECT – II

Industrial Training Project - II should be the outcome of the training done/performed during after 7th semester .It should be submitted in hardware form (proto type)or simulation form along with proper data and certificates issued during project training. It should cover the electrical engineering aspects learned during training. A Power point presentation should also be submitted at the time of submission. It can be in the form of major project.

ITC- 807 General Proficiency

This course objective is to develop the ability to handle all the tasks associated with the job and Ethics refers to behavior that adheres to societal norms and human conscience. In other words, a way of working that is honest and transparent.